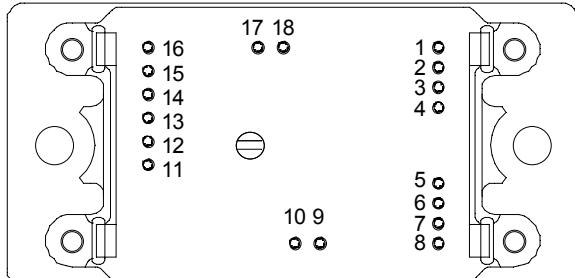
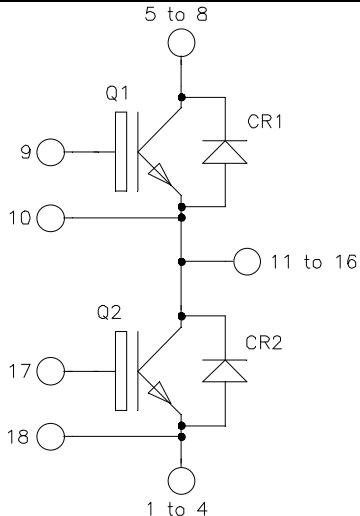


Phase leg
Fast Trench + Field Stop IGBT3
Power Module

$V_{CES} = 1200V$
 $I_C = 150A @ T_c = 80^\circ C$



Pins 1/2/3/4 ; 5/6/7/8 ; 11/12/13/14/15/16
 must be shorted together

Application

- Welding converters
- Switched Mode Power Supplies
- Uninterruptible Power Supplies
- Motor control

Features

- Fast Trench + Field Stop IGBT3 Technology
 - Low voltage drop
 - Low tail current
 - Switching frequency up to 20 kHz
 - Soft recovery parallel diodes
 - Low diode VF
 - Low leakage current
 - RBSOA and SCSSOA rated
- Kelvin emitter for easy drive
- Very low stray inductance
- High level of integration

Benefits

- Outstanding performance at high frequency operation
- Stable temperature behavior
- Very rugged
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Easy paralleling due to positive T_C of V_{CESat}
- RoHS Compliant

All ratings @ $T_j = 25^\circ C$ unless otherwise specified

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{CES}	Collector - Emitter Breakdown Voltage	1200	V
I_C	Continuous Collector Current	$T_C = 25^\circ C$	220
		$T_C = 80^\circ C$	150
I_{CM}	Pulsed Collector Current	$T_C = 25^\circ C$	350
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_C = 25^\circ C$	690
RBSOA	Reverse Bias Safe Operating Area	$T_j = 125^\circ C$	300A @ 1150V

 **CAUTION:** These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.
 See application note APT0502 on www.microsemi.com

Electrical Characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
I_{CES}	Zero Gate Voltage Collector Current	$V_{GE} = 0V, V_{CE} = 1200V$				50	μA
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$V_{GE} = 15V$	$T_j = 25^\circ C$		1.7	2.1	V
		$I_C = 150A$	$T_j = 125^\circ C$		2.0		
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 3 mA$		5.0	5.8	6.5	V
I_{GES}	Gate – Emitter Leakage Current	$V_{GE} = 20V, V_{CE} = 0V$				400	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
C_{ies}	Input Capacitance	$V_{GE} = 0V$ $V_{CE} = 25V$ $f = 1MHz$			10.7		nF
C_{oes}	Output Capacitance				0.56		
C_{res}	Reverse Transfer Capacitance				0.48		
Q_G	Gate charge	$V_{GE} = \pm 15V, I_C = 150A$ $V_{CE} = 600V$			1.4		μC
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ($25^\circ C$) $V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 150A$ $R_G = 2.2\Omega$			280		ns
T_r	Rise Time				40		
$T_{d(off)}$	Turn-off Delay Time				420		
T_f	Fall Time				75		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ($125^\circ C$) $V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 150A$ $R_G = 2.2\Omega$			290		ns
T_r	Rise Time				45		
$T_{d(off)}$	Turn-off Delay Time				520		
T_f	Fall Time				90		
E_{on}	Turn-on Switching Energy	$V_{GE} = \pm 15V$	$T_j = 125^\circ C$		14		mJ
E_{off}	Turn-off Switching Energy	$I_C = 150A$	$T_j = 125^\circ C$		16		
I_{sc}	Short Circuit data	$V_{GE} \leq 15V ; V_{Bus} = 900V$ $t_p \leq 10\mu s ; T_j = 125^\circ C$			600		A
R_{thJC}	Junction to Case Thermal Resistance					0.18	$^\circ C/W$

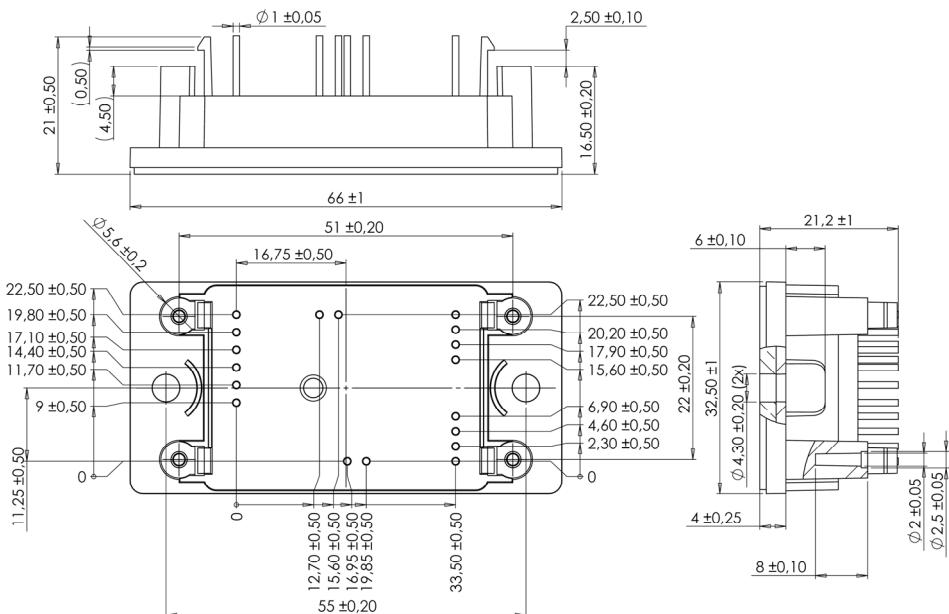
Reverse diode ratings and characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit	
V_{RRM}	Maximum Peak Repetitive Reverse Voltage			1200			V	
I_{RM}	Maximum Reverse Leakage Current	$V_R = 1200V$				50	μA	
I_F	DC Forward Current		$T_c = 80^\circ C$		150		A	
V_F	Diode Forward Voltage	$I_F = 150A$	$T_j = 25^\circ C$		1.6	2.1	V	
			$T_j = 125^\circ C$		1.6			
t_{rr}	Reverse Recovery Time	$I_F = 150A$ $V_R = 600V$ $di/dt = 3000A/\mu s$	$T_j = 25^\circ C$		170		ns	
			$T_j = 125^\circ C$		280			
Q_{rr}	Reverse Recovery Charge		$T_j = 25^\circ C$		15		μC	
			$T_j = 125^\circ C$		29			
E_r	Reverse Recovery Energy		$T_j = 25^\circ C$		7		mJ	
			$T_j = 125^\circ C$		12			
R_{thJC}	Junction to Case Thermal Resistance					0.34	$^\circ C/W$	

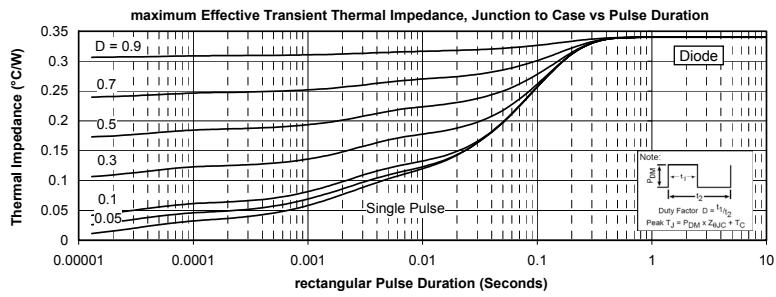
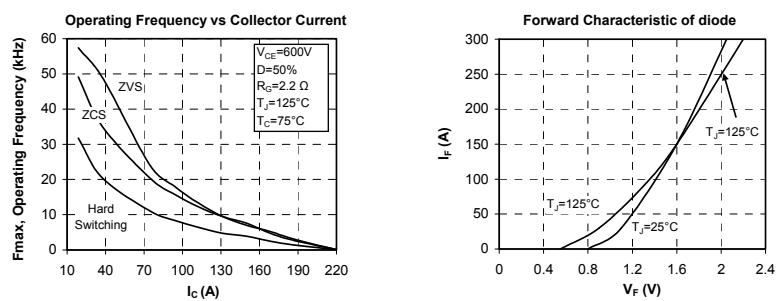
Thermal and package characteristics

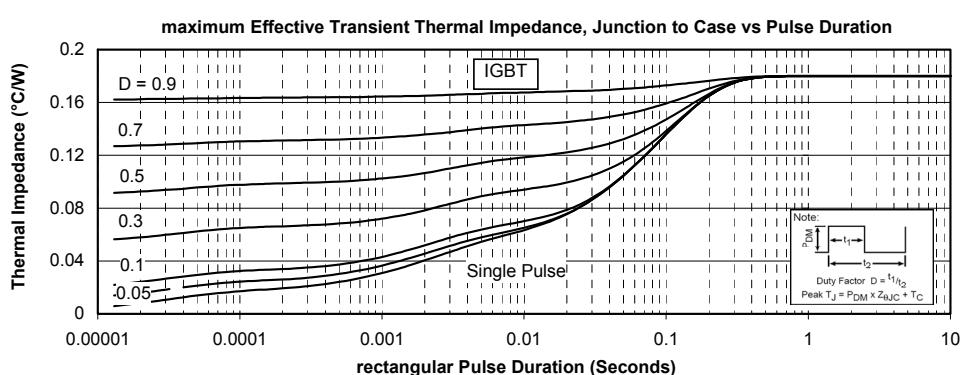
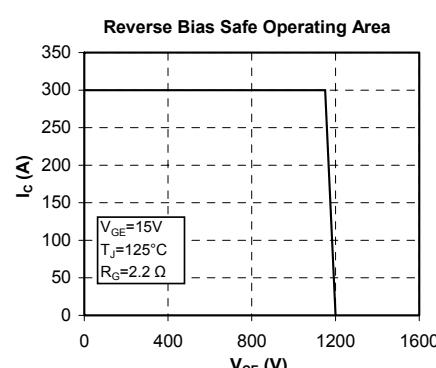
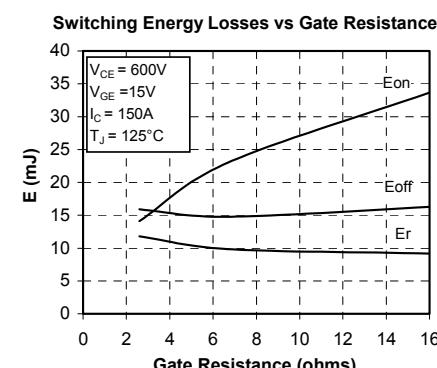
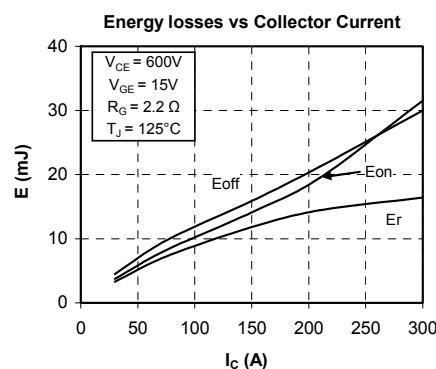
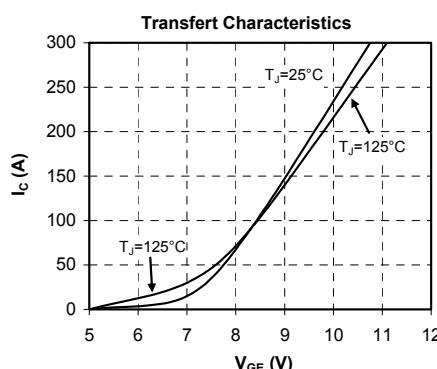
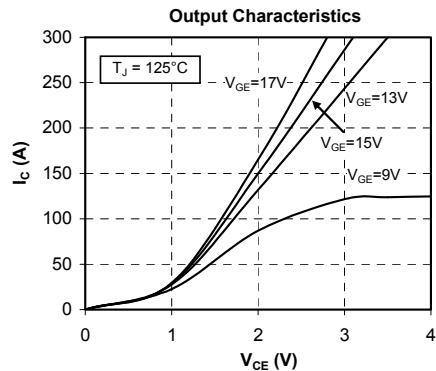
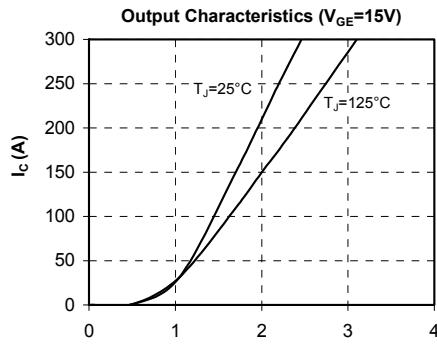
Symbol	Characteristic	Min	Typ	Max	Unit
V_{ISOL}	RMS Isolation Voltage, any terminal to case t = 1 min, 50/60Hz	4000			V
T_J	Operating junction temperature range	-40		150	
T_{STG}	Storage Temperature Range	-40		125	$^{\circ}\text{C}$
T_C	Operating Case Temperature	-40		100	
Torque	Mounting torque	To heatsink	M4	2	3 N.m
Wt	Package Weight			75	g

SP2 Package outline (dimensions in mm)



Typical Performance Curve





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